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CANTOR COLBURN, LLP 55 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002			LAMB, CHRISTOPHER RAY	
			ART UNIT	PAPER NUMBER
			2627	

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/065,882  
Filing Date: November 27, 2002  
Appellant(s): HARDING, KEVIN GEORGE

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Ira M. Turner  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed November 2<sup>nd</sup>, 2006 appealing from the  
Office action mailed June 9<sup>th</sup>, 2006.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

This appeal involves claims 5, 6, 11, 12, 19, and 21.

**(4) Status of Amendments After Final**

No amendment after final has been filed.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is deficient. 37 CFR 41.37(c)(1)(v) requires the summary of claimed subject matter to include: (1) a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, referring to the specification by page and line number, and to the drawing, if any, by reference characters and (2) for each independent claim involved in the appeal and for each dependent claim argued separately, every means plus function and step plus function as permitted by 35 U.S.C. 112, sixth paragraph, must be identified and the structure, material, or acts described in the specification as corresponding to each claimed function must be set forth with

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reference to the specification by page and line number, and to the drawing, if any, by reference characters. The brief is deficient because the page and line numbers cited do not appear to correspond to the appropriate parts of the specification. For example, the Applicant states that the subject matter of "reading the set of data in the N<sup>th</sup> diffraction order wavefront for a second selected hologram by changing the wavelength" corresponds to page 6, line 24. However, in the specification filed November 27<sup>th</sup>, 2002, this subject matter appears to be on page 7. There was an amendment to the specification filed January 5<sup>th</sup>, 2006, but even accounting for this, the Applicant's references appear to be off. This particular example is just one of many: as far as the Examiner can determine, none of the Applicant's page and line number references correspond to the appropriate portion of the specification for the subject matter referenced.

#### **(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows:

#### **WITHDRAWN REJECTIONS**

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner. the rejection of claim 15 under 35 U.S.C. 112, first paragraph. This claim is now allowed.

Claims 5, 6, 11, 12, 19, and 21 are still rejected.

#### **(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

#### **(8) Evidence Relied Upon**

No evidence is relied upon by the examiner in the rejection of the claims under appeal.

### **(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 5, 6, 11, 12, 19, and 21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

To be complete, this rejection has been repeated from the previous office action.

Regarding claims 5 and 11, the subject matter of "reading the set of data in the N<sup>th</sup> diffraction order wavefront for a second selected hologram by changing the wavelength of one optical beam with respect to the other" fails to comply with the enablement requirement.

Changing the wavelength of one optical beam is well known in the art. However, using it to select a second selected hologram appears to require "memory access media" which are not sufficiently described in the specification to enable one skilled in the art to which it pertains to make and/or use the invention without undue experimentation.

The relevant portion of the specification appears to be paragraph 27, in which “changing the wavelength of the interfering optical beams 210, 212 different memory address media layers 206 are caused to affect the polarization retardation of the optical beams 210, 212. Thus, by selecting the wavelengths of the beams 210, 212 one selects which memory address media layer 206 changes or shifts the polarization rotation of the optical beams 210, 212.”

The memory access media are thus crucial to select the second selected hologram, but are not further described in the specification to enable one skilled in the art to which it pertains to make and/or use the invention without undue experimentation.

Regarding claims 6 and 12, the subject matter of “reading the set of data in the  $N^{\text{th}}$  diffraction order wavefront for a second selected hologram by changing the state of polarization of one optical beam with respect to the other” similarly requires the memory access media, which are not described in the specification to enable one skilled in the art to which it pertains to make and/or use the invention without undue experimentation.

Regarding claims 19, “means for creating an interference pattern between two beams of light at a selected one of the discrete memory locations” similarly requires the memory access media, because the claim recites “the two beams of light are cross polarized” and “the means for creating an interference pattern comprises rotating at least one of the beams of light.” This requires the memory access media, which are not described in the specification to enable one skilled in the art to which it pertains to make and/or use the invention without undue experimentation.

Regarding claim 21, "means for creating an interference pattern between two beams of light at a selected one of the discrete memory locations" and "wherein the plurality of recording address access media comprise media which cause a change in phase of the two beams of light with respect to one another generating thereby non-cross polarized beams of light" similarly requires the memory access media, which are not described in the specification to enable one skilled in the art to which it pertains to make and/or use the invention without undue experimentation.

#### **(10) Response to Argument**

For convenience, Applicant's argument will be addressed using the same subsection headings as Applicant.

##### **I. "Are memory access media required?"**

First, in page 9 and 10, Applicant argues that the specification discloses alternate approaches that do not require the memory access media. These alternate embodiments, Applicant concludes, enable the claims without any need to prove the memory access media itself is enabled.

This argument was found to be persuasive in the case of claim 15, and thus that claim is now allowed. However, it is not relevant to the other claims, because these alternate approaches do not enable the specific subject matter of those claims.

The claimed subject matter which is not enabled is as follows (as per the rejection above):

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Claim 5: "reading the set of data in the N<sup>th</sup> diffraction order wavefront for a second selected hologram by changing the wavelength of one optical beam with respect to the other."

Claim 6: "reading the set of data in the N<sup>th</sup> diffraction order wavefront for a second selected hologram by changing the state of polarization of one optical beam with respect to the other."

Claim 11: as per claim 5.

Claim 12: as per claim 6.

Claim 19: "means for creating an interference pattern between two beams of light at a selected one of the discrete memory locations in the recording media...wherein the two beams of light are cross polarized with respect to one another and the means for creating an interference pattern comprises rotating at least one of the beams of light."

Claim 21: as per claim 19.

Applicant cites several alternate approaches:

The first (bottom of page 9) "may include matching the angular and wave shape content of the reference beam of the holographic recording." This does not appear related to reading a second selected hologram, to changing the wavelength of one beam with respect to the other, or to rotating the polarization of one beam with respect to the other.

The second (third paragraph of page 10) cites paragraph 17 and Fig. 4 of the specification. The Examiner found this alternate embodiment to be enabling in the specific case of claim 15, which is now allowed. However, this paragraph and figure



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does not disclose reading a second hologram by changing the wavelength or the polarization of either beam, and thus it does not enable the subject matter of claims 5, 6, 11, 12, 19, and 21.

The disclosure of the cited subject matter of those claims appears in the specification to be confined to paragraph 27. In that paragraph, is clear that reading a hologram by changing the wavelength or polarization requires the memory access media. No alternate approaches are disclosed which both change the wavelength or polarization and do not require the memory access media. Thus, to answer the question posed by Applicant in the title of this section: yes, the memory access media are required – at least for the specific subject matter of the claims under appeal.

## II. "Is memory access media sufficiently described in the disclosure?"

In pages 10-12, Applicant argues that the memory access media is sufficiently described in the specification.

Applicant references paragraph 27, paragraph 17, and figures 1, 2, 3, 6, and 10 to prove that the memory access media is sufficiently described. Applicant primarily relies on a portion of paragraph 27. This quoted section essentially states that the memory access media control the polarization of beams passing through them.

Applicant then provides references to prove that materials that control polarization are known.

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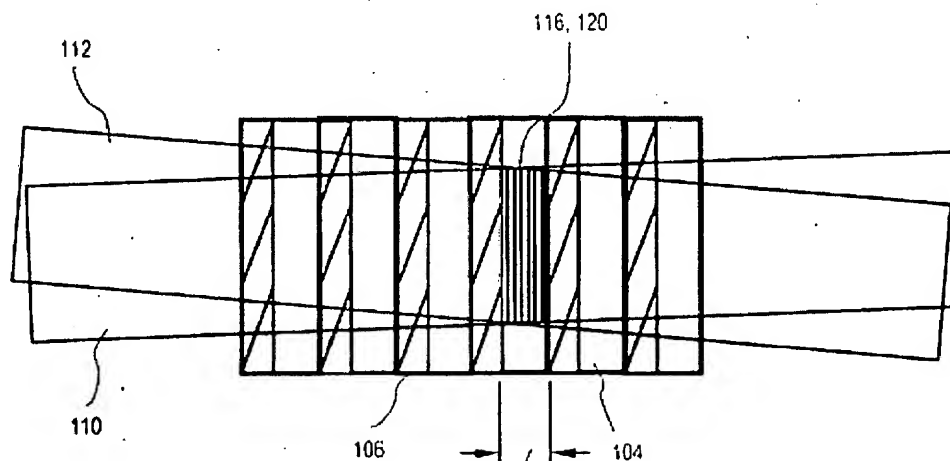
Applicant concludes by arguing that since the memory access media control polarization, and since materials which control polarization are known, one of ordinary skill would be able to make and use the claimed invention.

This argument ignores the specific requirements of the claimed invention. Materials which control polarization may be known, but do these materials have the specific properties necessary to enable the Applicant's invention?

At this point, it is probably worth reviewing what those properties are:

The Applicant's invention sends two beams into a stack of holographic recording material:

FIG. 6



The two beams interfere at one particular hologram but not at any others. Notice from the figure (Fig. 6 of the specification) that the two beams overlap over many of the holographic layers 104. Nonetheless, they only interfere at one specific holographic layer.

According to paragraph 27 of the specification, this is because the two beams are cross polarized until they reach the media access layer before the hologram to be read. Somehow that layer rotates the polarization of one beam but not the other, so that the two beams are similarly polarized. They then interfere, and when they reach the memory access layer after the hologram to be read, that layer rotates one of the beams again, so that they don't interfere as they pass through the subsequent holograms.

The specification states that by changing the wavelength of the beams, the specific memory access layer which rotates the beam can be chosen, allowing a specific hologram to be read.

So, in order to be enabled, judging from the specification, the memory access media must have the property that they are able to rotate the polarization of a beam of a specific wavelength but allow beams of other wavelengths to pass through unchanged: this is essential, because only the memory access media related to the specific hologram to be read should rotate the beam.

However, it is important to note that two light beams only interfere with one another if they both have similar frequencies. Thus the two beams of the Applicant's invention cannot have very different frequencies from one another. This yields a second requirement for the memory access media: it must be able to rotate the polarization of a beam of a specific wavelength but allow beams of a very close wavelength to pass through unchanged.

In order for Applicant's argument to be convincing, the references Applicant submitted must demonstrate these abilities. The Examiner has considered each in turn.

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Hopper et al. (US 4,388,375): This patent is directed toward preparing a polarizer with increased hydrolytic stability. The wavelength and polarizing properties of the polarizer are not disclosed.

Ouderkirk et al. (US 6,096,375): This patent is directed toward a hybrid polarizer consisting of the combination of a reflected and a dichroic polarizer. As noted in column 1, lines 55-67, the polarizer "provides a high reflectivity for light of a first polarization and high transmission for light of a second, perpendicular polarization" from one side and "high absorption for light of the first polarization and high transmission for light of the second, perpendicular polarization" from the other side. Since the Applicant's invention requires not only that both polarizations be transmitted, but that the light from one be converted into light of the other, it is not readily apparent how this reference enables the Applicant's invention.

Jonza et al. (US 6,635,377): Jonza discloses (abstract) essentially a mirror, with high reflectivity over a wide bandwidth, either for both polarizations or for just one (column 1, lines 25-35). Again, this does not appear to have the properties required for Applicant's invention.

Hashimoto (US 6,657,690): Hashimoto appears to be directed to the chemical composition of a liquid crystal display. It doesn't appear to be relevant to the enablement of Applicant's invention.

Yano et al. (US 6,667,835): Yano is directed to a polarizing film. There is no disclosure in Yano that the film can rotate the polarization of one wavelength of light and yet ignore the polarization of a very similar wavelength.

To conclude this section, the Applicant's argument is essentially that because materials related to polarization are known, the application is enabled: however, Applicant fails to prove that materials that control polarization in the manner required by the application are known.

### III. Conclusion

It is the conclusion of the Examiner that, first, the memory access media are required to enable the subject matter of the appealed claims; and, second, that the Applicant has failed to demonstrate that the memory access media could be made and/or used by one of ordinary skill in the invention without undue experimentation.

In reaching this conclusion, the Examiner has considered, among others, the following factors:

(A) The level of one of ordinary skill: as the invention is directed toward holographic recording, one of ordinary skill would presumably be knowledgeable about optics and thus familiar with the general concept of polarizing materials. However, it is not clear that one of ordinary skill would know of materials with the specific required properties, especially since the Applicant has been unable to provide any examples of one.

It is also worth noting that none of the references provided by Applicant come from the subject area of holographic or optical recording, suggesting that one of ordinary skill in those arts may not have substantial knowledge of the materials Applicant appears to believe are relevant.

(B) The state of the prior art: none of the prior art of record discloses memory access media with properties such as Applicant discloses.

(C) The amount of direction provided by the inventor: which is to say, almost none. The entire description of this critical portion of the invention is confined to a few sentences in one paragraph of the specification.

(D) The existence of working examples: there are none. The Applicant does not give a single example of a suggested material for the media access layers.

(E) The quantity of experimentation needed to make and or use the invention based on the content of the disclosure: this would seem to be considerable. One of ordinary skill would need to determine for themselves the necessary, specific properties of the memory access media and then, with no direction from the inventor, find or invent materials with these properties.

#### **(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.


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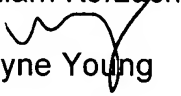
For the above reasons, it is believed that the rejections should be sustained.

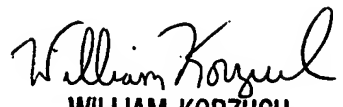
Respectfully submitted,

CRL 12/7/06

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